**Electricity – Key facts**

* A series circuit is made of components joined in one circle
* All circuits must have a cell (what we generally call a battery) to provide the push(voltage) to move the electricity (current) around the circuit
* Two cells joined together in a circuit are known as a battery
* All components have two connection points

**Components**

A cell has a positive and a negative terminal. When putting cells (batteries) into an appliance they must be inserted the correct way round. When joining two cells together to form a battery, they need to be connected positive to negative. It is a good idea for children to experience using cells without the holders.

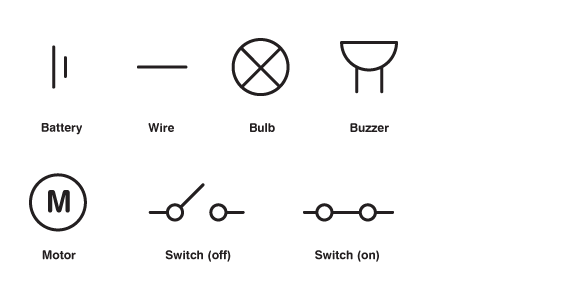
Bulb – for the bulbs that most schools use the connection points are at the base and on the metal screw. Usually they will be used in a bulb holder but it is a good idea for children to also make circuits without the bulb holder. Bulbs have different voltages. The voltage is written very small just above the screw. If you increase the voltage in the circuit by adding more batteries or a higher voltage battery the bulb will be brighter. If you have too high a voltage the bulb will blow and not work anymore. If you put two bulbs in a circuit they will be dimmer as the voltage is shared between them.

Buzzers – these need to be connected the right way round otherwise they do not work. Buzzers require a higher voltage and if put in a circuit with a bulb or motor often the other component does not have enough voltage to work. The electricity (current) is still flowing through it but is insufficient to light the bulb or make the motor spin.

Motors – these provide a spinning motion. You can add a propeller or fan which shows the motion more clearly. If you connect it around the other way it will spin in the opposite direction. If you increase the voltage it will spin faster.

Switch – there are a range of different types of switches. The children should be able to make different switches to suit different applications e.g. an on/off switch for a torch, a compression switch for a burglar alarm (switches on when the burglar steps on the door mat), forward/backward switch for a motor (to control a car going forwards and backwards), a dimmer switch for a light.

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| Component | Effect of increasing voltage | Effect of connecting other way round |
| Bulb | Brighter, will eventually pop | No change |
| Buzzer | May be louder | Does not work |
| Motor | Spins faster | Changes direction |

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**Circuit symbols**